



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,094	03/04/2002	Man Hon Cheng	SC11852HP	4346

7590 09/11/2003

MOTOROLA, INC.
7700 WEST PARMER LANE
MAIL DROP PL02
AUSTIN, TX 78729

EXAMINER

THAI, LUAN C

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 09/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/090,094

Applicant(s)

CHENG ET AL.

Examiner

Luan Thai

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-11 and 13-19 is/are pending in the application.
- 4a) Of the above claim(s) 13-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 26 June 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office action is responsive to the amendment filed June 23, 2003.

Claims **1-4, 6-11, 13-18** and newly added claim **19** are pending in this application.

Claims **13-18** have been withdrawn from the consideration as being directed to a non-elected invention (paper number 5).

Claims **5** and **12** have been cancelled by applicant (e.g., Amendment dated 3/26/03).

Election by Original Presentation

1. Newly submitted claim 19 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

- I. Claims 1-12, drawn to a semiconductor device, classified in class 257, subclass 676.
- II. Claim 19, drawn to a method of making a semiconductor device, classified in class 438, subclass 123+.

2. The inventions are distinct, each from the other because of the following reasons: Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case unpatentability of the Group I invention would not

Art Unit: 2827

necessarily imply unpatentability of the Group II invention, since the device of the group I invention could be made by processes materially different from those of the Group II invention. For example, the semiconductor of claim 1 can be made by attaching an extended adhesive material layer on bottom surface of an integrated circuit die then mounting the die on a base carrier with the adhesive layer disposed therebetween.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, not only claims 13-18 but also claim **19** are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Kikuchi et al (6,037,677), as set forth in the previous Office Action paper Number 5 and now repeated.

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-5, Kikuchi et al (see specifically figure 8 and figure 9 being turned upside down) disclose a semiconductor device comprising: a lead frame (11A-11B), which comprises: a base carrier (11B) having a top side and a bottom side, the top side having a central area for receiving an integrated circuit die (12) and a peripheral area, leads (11A) electrically connected to the bonding pads (12a) of the die (12) via wirings (14). The semiconductor device further comprises: an extended adhesive material layer (13) disposed on the top side of the base carrier, covering the central area and a large portion of the peripheral area of the base carrier top surface; the integrated circuit die (12) attached to the base carrier with the adhesive material layer at the central area; an encapsulant (15) surrounding the base carrier (11B), the die (12), and at least a portion of the lead frame (11A), wherein the device is an exposed pad type package device (e.g., the bottom side of carrier (11B) and lead frame (11A) are exposed from the package).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kikuchi et al (6,037,677) in view of Heckman (US 2002/0182774), as set forth in the previous Office Action paper Number 5 and now repeated.

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 6 and 9-11, Kikuchi et al disclose all the limitations of the claimed invention as detailed above except for the adhesive material layer being in an "X" shaped pattern.

Heckman while related to a similar structure of bonding an integrated circuit die on a base carrier (12) of a lead frame (see paragraph [0002], lines 6+) teaches (see specifically figures 2-3): an adhesive material layer (16A) disposed on the topside of the base carrier (12) in an "X" shaped pattern (paragraph [0023], lines 4+) including two bisecting lines extending beyond the central area and into the peripheral area of the base carrier top surface (paragraph [0021], lines 2+), an adhesive film (14) used to form the pattern of the base carrier (12), and an integrated circuit die (28) attached to the base carrier with the adhesive layer (16A) at the central area. The purpose of doing so is to control over the edges and the final thickness of the bonding layer to a degree that was not previously possible (paragraph [0017], lines 3+).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Heckman teachings to Kikuchi et al's device package in order to control over the edges and the final thickness of the device to a degree that was not previously possible.

Regarding claims 7 and 8, the proposed device of Kikuchi et al and Heckman discloses all the limitations of the claimed invention (including a four

pointed star shape of the adhesive layer 16A, see figures 1, 2, 4A-4B), as detailed above, except for the claimed of other shapes of the adhesive layer (e.g., a six pointed star or an eight pointed star, as recited in claims 8 and 9 respectively). It would have been an obvious matter of design choice to change the shape of the adhesive layer 16A in the proposed device of Kikuchi et al and Heckman to another shape such as a six pointed star or an eight pointed star as claimed, since Heckman does suggest that the adhesive layer 16A may have a variety of symmetrical or asymmetrical shapes (paragraph [0019], lines 1+), and the shape differences are considered obvious design choices and are not patentable unless unobvious or unexpected results are obtained from these changes. Additionally, the Applicant has presented no discussion in the specification which convinces the Examiner that the six-pointed star shape or eight-pointed star shape of the adhesive layer is anything more than a change in number of point in a star shape a person of ordinary skill in the art would find obvious for the purpose of providing a bond between a die and a base carrier. *In re Dailey*, 149 USPQ 47 (CCPA 1976). It appears that these changes produce no functional differences and therefore would have been obvious.

Response to Arguments

7. Applicant's arguments filed on June 26, 2003 have been fully considered but they are not persuasive. Specifically:

Applicant argues, in page 9, the last two paragraphs and in page 10, the first two paragraphs, of the Remarks, that Kikuchi et al. do not teach "the

extended adhesive material means that the adhesive material extends beyond the edges of the die and such extension is greater than or equal to two times the thickness of the die. See Specification, paragraph [0025]".

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the adhesive material extends beyond the edges of the die and such extension is greater than or equal to two times the thickness of the die) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

8. Applicant's amendment filed on June 26, 2003 has been fully considered but they are not persuasive. Therefore, **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2827

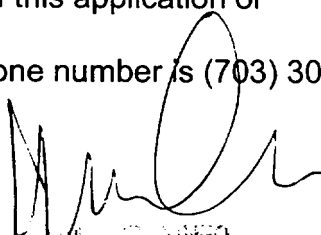
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211.

The examiner can normally be reached on 6:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on (703) 308-1233. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Luan Thai
September 3, 2003



KAMMIE CUNEO
SUPERVISOR PATENT EXAMINER
TECHNOLOGY CENTER 2300